

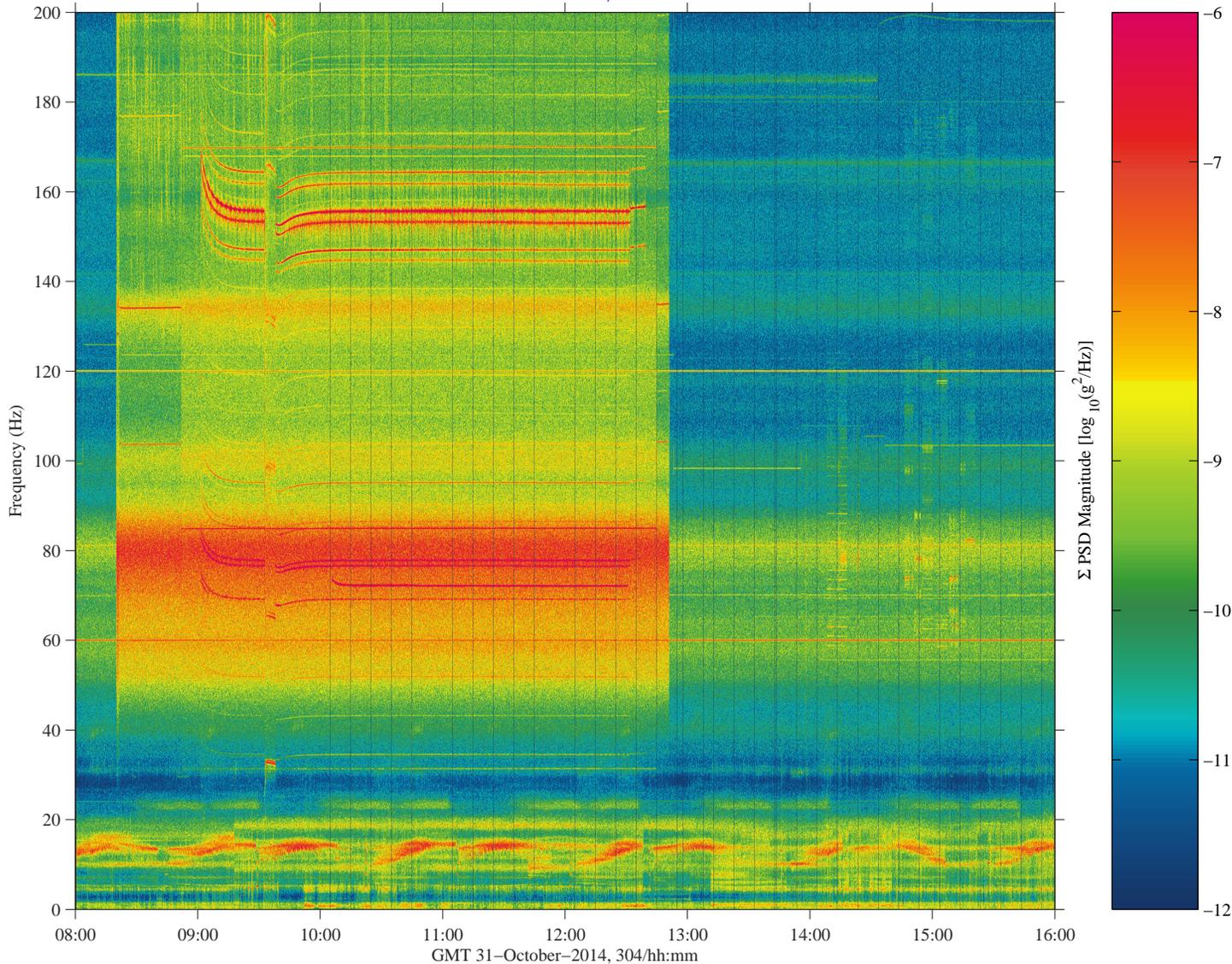
ESA EDR EML Activities Qualify

sams2, 121f02 at COL1F1 H2, Seat Track near EML on EDR:[460.38 193.43 204.98]
500.0000 sa/sec (200.00 Hz)
 $\Delta f = 0.122$ Hz, Nfft = 4096
Temp. Res. = 8.192 sec, No = 0

sams2, 121f02

Start GMT 31–October–2014, 304/08:00:00.001

Sum
Hanning, k = 3515
Span = 8.00 hours



from: misc/yoda/pub/pad_pims_02-Nov-2014,06:57:23.490

Description	
Sensor	SAMS 121f02 500.0 sa/sec, 200.0 Hz
Location	COL1F1 H2, Seat Track near EML on EDR
Plot Type	Spectrogram

Notes:

- The color spectrogram here shows some vibratory signatures measured by a SAMS sensor near the Electro-Magnetic Levitator (EML) in the European Drawer Rack (EDR) of the Columbus module. The times for these vibratory signatures appear to correlate well with some of the EDR/EML activation, test, and deactivation times related to experiment checkout operations.
- Note the broadband vibrations between about 40 Hz and 200 Hz that start at about GMT 08:20 and end at about 12:50. These times correspond to EDR activation and deactivation, respectively.
- The ladder of narrow-band traces seem attributable to a combination of the AAA fan, ECE, HOS, HSC and DVS.

Regime:	Vibratory
Category:	Equipment
Source:	ESA EDR EML Activities



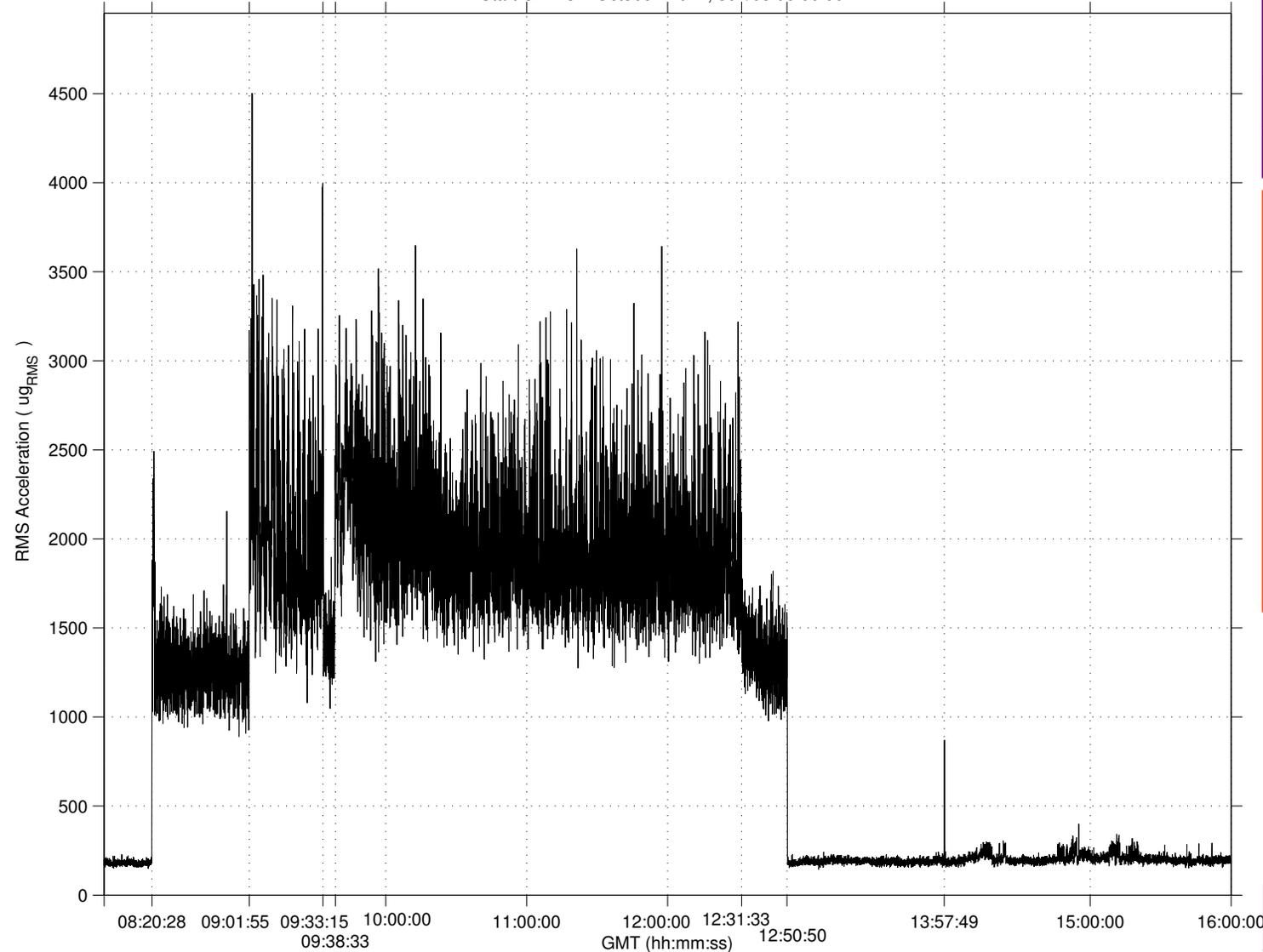
ESA EDR EML Activities Quantify

sams2, 121f02 at COL1F1 H2, Seat Track near EML on EDR:[460.38 193.43 204.98]
500.0000 sa/sec (200.00 Hz)
Δf: 0.488 Hz, Range: 20 - 200 Hz
Temp. Resolution: 2.048 sec

SAMS2, 121f02, COL1F1 H2, Seat Track near EML on EDR, 200.0 Hz (500.0 s/sec)

SSAnalysis[0.0 0.0 0.0]
Hanning, κ = 1

Start GMT 31-October-2014, 304/08:00:00.001



Description

Sensor	SAMS 121f02 500.0 sa/sec, 200.0 Hz
Location	COL1F1 H2, Seat Track near EML on EDR
Plot Type	RMS vs. Time

Notes:

- This plot of RMS acceleration versus time is the same GMT span as the spectrogram on the previous page and for the same SAMS sensor. The RMS value here is for the frequency range from 20 to 200 Hz.
- **Without EDR/EML activity, the nominal RMS value was about 200 ugRMS.**
- **During EDR/EML activity, the RMS stepped up to range from about 1000 ugRMS to about 3000 ugRMS.**
- Note that some of the time axis tick marks correlate with ESA ops notes times detailed on the last page.

Regime:	Vibratory
Category:	Equipment
Source:	ESA EDR EML Activities

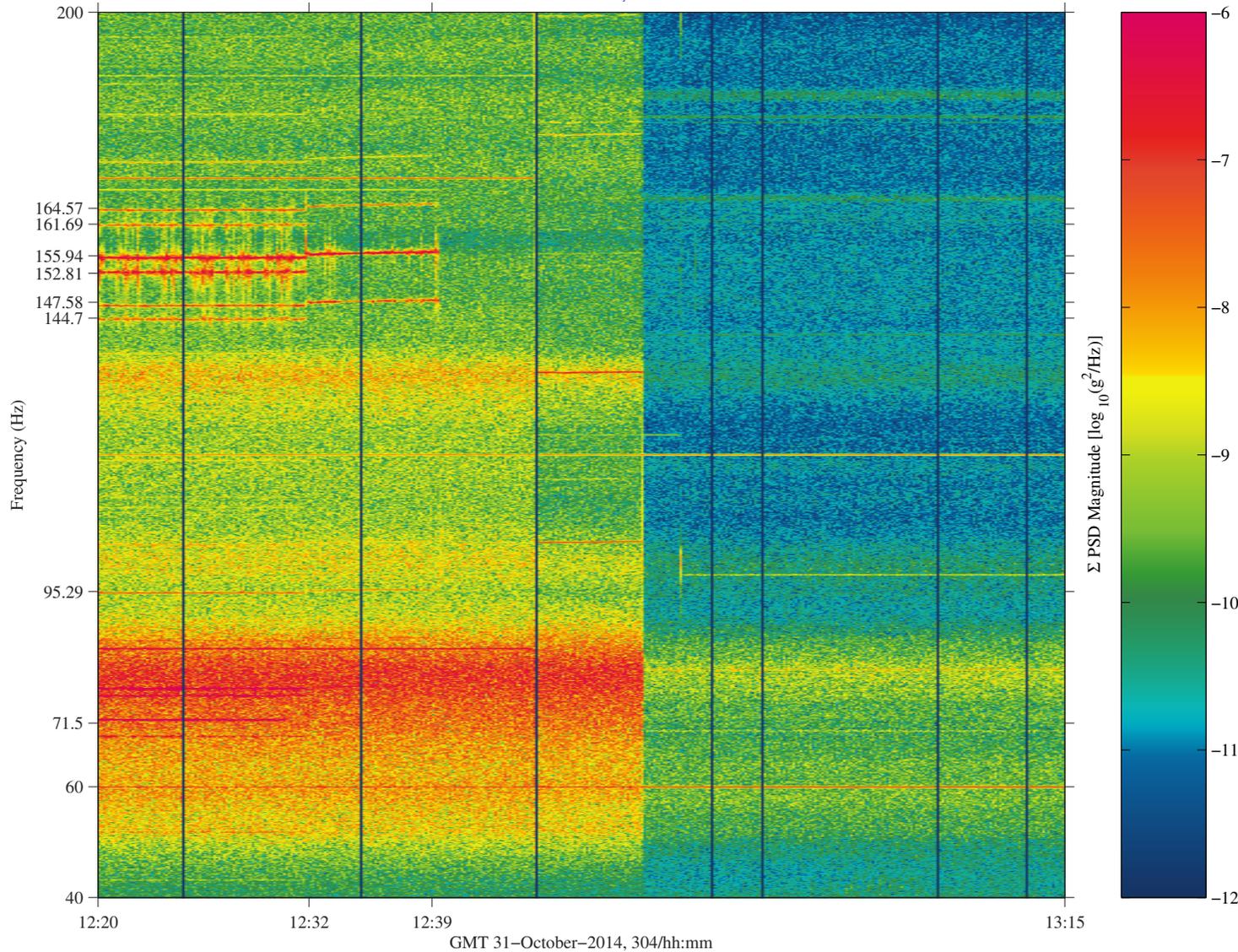


ESA EDR EML Activities Qualify

sams2, 121f02 at COL1F1 H2, Seat Track near EML on EDR:[460.38 193.43 204.98]
500.0000 sa/sec (200.00 Hz)
 $\Delta f = 0.122$ Hz, Nfft = 4096
Temp. Res. = 8.192 sec, No = 0

sams2, 121f02

Start GMT 31-October-2014, 304/08:00:00.001



Sum
Hanning, k = 3515
Span = 8.00 hours

Description

Sensor	SAMS 121f02 500.0 sa/sec, 200.0 Hz
Location	COL1F1 H2, Seat Track near EML on EDR
Plot Type	Spectrogram

Notes:

- This color spectrogram is zoom in on both the time and the frequency axes relative to the plot shown on the first page.
- The zoom-in here shows a few of the “ladder” narrow-band spectral peaks that did not have a definitive time correlation with log entries (see last page for those).
- We would like to further identify the transitions seen at GMT 12:32 and 12:39 for the narrow-band spectral peaks at the values shown with 2 decimal places on the frequency axis.
- **If you have any information that might help identify these signatures, then please email to pimsops@grc.nasa.gov and thanks!**

Regime:	Vibratory
Category:	Equipment
Source:	ESA EDR EML Activities



ESA EDR EML Activities Ancillary Notes

The table below shows **good correlation** between EDR/EML operations notes related to activities associated with EDR/EML activity in the “EDR/EML Ops Note” column and analysis of SAMS sensor (SE-F02) measurements in the “SAMS Note” column:

GMT	EDR/EML Ops Note	SAMS Note
08h20	EDR activated.	Correlates with RMS step from 200 to about 1400 <u>ugRMS</u> (for $20 < f < 200$ Hz).
08h52	EDR AAA fan to 5152 RPM	Correlates with narrow-band spectral peak step from 103.7 to 84.8 Hz (from 6222 to 5088 RPM).
09h00	ECE activated.	Correlates with “ladder” of narrow-band spectral peaks with exponential frequency decay.
09h10	HOS activated.	No obvious correlation with SAMS vibratory signatures.
10h05	HSC activated.	Correlates with sudden start of narrow-band spectral peak at about 71.8 Hz (4308 RPM).
10h35	HSC transmission tests until 11h00.	Steady-state for notable signatures identified to this point in time.
11h20	DVS activated.	No obvious correlation with SAMS vibratory signatures.
11h45	HSC+DVS transmission tests until 12h15.	No obvious correlation with SAMS vibratory signatures.
12h30	EML <u>de-activation</u> started.	Correlates with sudden stop of narrow-band spectral peak at about 72.0 Hz (4320 RPM).
12h45	EDR AAA fan back to 3200 RPM.	Correlates with appearance of narrow-band spectral peak at about 104.4 Hz**.
12h51*	EDR <u>de-activated</u> .	Correlates with 3 notable changes: RMS step from 1400 to about 200 <u>ugRMS</u> (for $20 < f < 200$ Hz). Stop of narrow-band spectral peaks at 104.4 Hz and 134.5 Hz. Stop broadband.
* inferred from SAMS measurements		** 2nd harmonic of 52.2 Hz = 3132 RPM

There were additional transitions that have not been (yet) identified as seen on a previous (3rd) page.

